

ABSTRACT

A device for manipulating a molecule *in vivo* relative to a target tissue includes at least one elongated member having at least two discrete and separately activatable electrodes separated by an insulating material interposed therebetween. The electrodes are configured to establish at least one of a first electromagnetic field between selected electrodes sufficient to manipulate a molecule
5 relative to a target tissue and a second, typically higher-level, electromagnetic field sufficient to cause transient permeability of a cell membrane within the target tissue. A third electromagnetic field may also be applied to cause further translation of the molecule into an electropermeabilized cell and/or manipulated with respect to the tissue. Thus three-dimensional manipulation of the
10 molecule relative to the target tissue may be effected to optimize a desired positioning thereof, such as entry into a cell.